REPORT BY THE KARRENBERG PARTY ON RUSSIAN W/T

Attached is a translation of a report written at our request by Uffz. KARRENBERG and his colleagues Uffz. SUSCHOWK, Ogefr. GRÜBLER, Uffz. SCHMITZ, Uffz. ERDMANN and Uffz. HEMPEL, all of OKH Gen. der N.A. Gruppe VI, on miscellaneous aspects of Russian W/T.

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For previous reports see TICOM/I-30, 149, 157, 166, 167 and 168.

Trans. W.R.L. and K.C.K.

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CONTENTS

Means of Communication

Communications are considered to be of real importance by the Soviet Russian Command. There are numerous instructions stressing the importance of perfect signal links and dealing with the training of signals soldiers. The Most Simple, mobile or electrical, means of communication suitable for the occasion are used for the setting up and maintenance of signals links.

The Most Simple Means of Communication

The Soviet Russian Army made more use of the most simple methods of communication than any other armies. The smaller units (Assault sections, reconnaissance and scouting sections, spy groups) scored the greatest successes often when using the most primitive means of conveying signals (bicycle or m/c despatch riders, message dogs, snow shoe messengers) as the main or supplementary means of communication.

Report Collecting Centre. (Пост сбора донесений /пс/-/псд/)

All reports obtained by employing the simplest methods of communication are delivered to the report collecting centre and are passed on further from here. This takes place either by land line or wireless, or likewise by the use of the simplest methods. If a greater distance is to be covered a Report Echelon (летучая почта) is set up. The report collecting centre is situated at a "Communications Junction" - a signals centre at which all of the means of communication are co-ordinated.

Communications Junction (узел связи / ус /)

The OC of the communications junction is the NUS (начальник узла связи). During operations the communications junction is set up in the immediate vicinity of the Battle HQ (КОМАНДНЫЙ ПУНКТ /КП/) and it effects a centralisation of all the means of communication at the disposal of the unit commander. The way the communications junction is set up depends on the unit and the task it has to fulfil. At the communications junction at a Regimental Battle HQ we find:

a) A Wireless Exchange (радио узел),   i.e. the Chief Wireless Station which has to maintain contact with the subordinate and higher stations.

b) A Telephone Exchange (центральная телефонная станция / ЦТС /).

c) Report Collecting Centre (ПУНКТ сбора донесений /псд/)

d) Air Observer and Communications Station (ВОЗДУШНОЕ наблюдение ОПОВЕЩЕНИЕ И СВЯЗЬ / ВНОС /).   Observation and warning station which keeps in touch continuously with the observer aircraft.

e) Air Communications Station (ПОСТ ВОЗДУШНОЙ СВЯЗИ / ПВС /). Their function is to maintain communications with the help of communications aircraft (САМОЛЕТ СВЯЗИ) At Company and Battalion battle HQ's the Air Communications and Air Observer Station is often replaced by a Signals Station (авпо-СИГНАЛЬНЫЙ ПОСТ)

f) Communications Reserve (резерв связи) At the larger units, such as divisions, Reporting Centres (головной ПОСТ СВЯЗИ) are also occasionally set up.

Mobile Means of Communication

Of the mobile means of communication the following were chiefly used:

a) Bicycle and m/c despatch riders with Report Echelons and columns on the march.

b) Aircraft for the speedy delivery of documents and for the transmission of information via the Air Communications Stations (ПОСТ ВОЗДУШНОЙ СВЯЗИ / ПВС /)

Electrical Means of Communication

The following were used:

1) Telegraphy

a) Line Telegraphy Baudot 2-channel, the teleprinter CT 34, morse facsimile recorder and even the Hughes Apparatus. Line telegraphy was used for lateral connection between adjacent Front Staffs, on lines from the Front Staffs to the General Staff, from Front Staffs to armies and presumably down to divisions. It is most probable that the carrier frequency procedure was employed but it has not been confirmed.

b) Wireless Telegraphy Machines: Baudot 2-channel, high speed morse. Employed on lines between the General Staff and Front Staffs, from Front Staffs to Assault Armies and from a few high Air Force HQ's in traffic with General Staff, Moscow. Hand-key morse was employed in all networks from Front Staffs inclusive downwards.

2) Telephony

a) Line Telephony The "уна-И " telephone (inductor call) was used for the networks inside the HQ's (ВНУТРЕННЯЯ СВЯЗЬ) and the " уна-ф " (buzzer call) for the tactical networks at the front (боовая связь). In networks in the L.of C. areas " ТаМ " and other telephones were used.

b) <u>Wireless Telephony.</u> Used by regiments inclusive downwards. For employment see the individual networks.

<u>Operational Army Network</u>

I) <u>Operational Network of the General Staff</u>

There were line connections from the General Staff to the Front Staffs and the 2-channel wireless teleprinter (Baudot) was used here as the chief means of communication. The 2-channel teleprinter (Baudot) on land line and probably the teleprinter (советскИй толстаЙп CT-34) were used for double banking (дублирующее средство связи) This would be represented diagrammatically as follows:
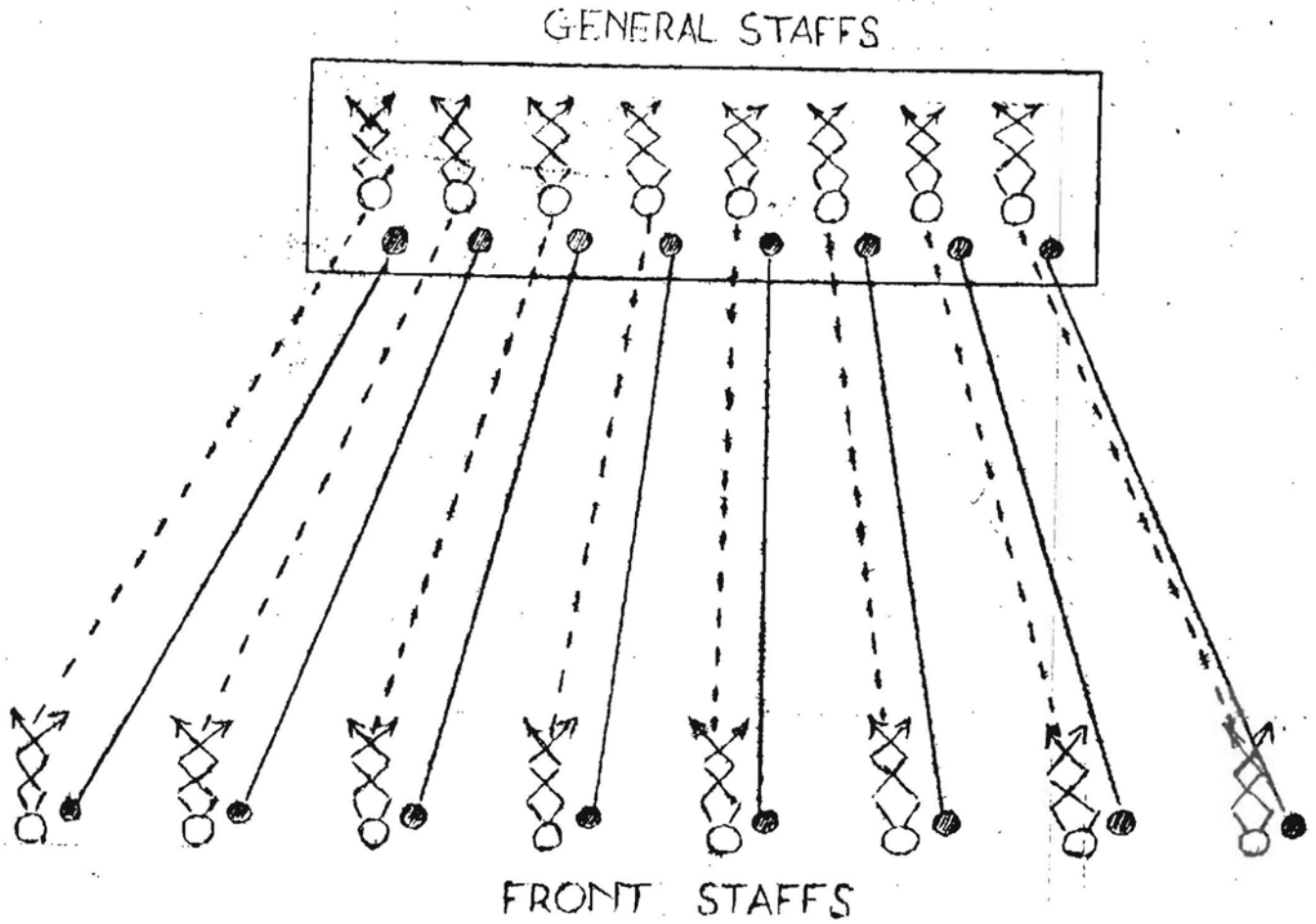
GENERAL STAFFS

FRONT STAFFS

There is no wireless teleprinter link between the individual
Front Staffs. If, for instance a message is sent from the first
White Russian Front to the second White Russian Front, it goes via the
General Staff, Moscow. Messages of that type could be recognised
from the preamble:

из небо нр 300/16 3/520 I4I0 2120 через ртуть/

Дунай шо шифровка ......

or

из небо нр 300/16 3/520 I4I0 2120 ч/ ртуть

2 Белорусский фронт ....

Messages from the stations subordinate to the Front Staffs were
also sent to Moscow. In such a case the cover name of the station
passing the message on was omitted and only the cover name of
the transmitting station was mentioned in the preamble.

In the points of main effort there were two wireless
teleprinter links from Front Staff to General Staff. They
operated simultaneously and with the same cover names but
on different frequencies.

The messages transmitted were concerned with
operational reconnaissance and operations reports, NKVD messages,
correspondence of the Personnel Department and of the Department
for Line of Communication Services. Traffic was, with few
exceptions (Orders of the Day, Communiques) encoded and in this connection
the following were used:-

5-letter and 5-figure codes for operational orders; these
were so-called Blocknot codes, which were only used once and were
therefore almost unbreakable. These Blocknot codes were used by
the General Staff, the Front Staffs and the armies (very little
here, however). Less important material was encoded by the 3-
figure and 4-figure code. They were usually messages to or from
the subordinate stations of the Front Staff. In addition a
machine cypher teleprinter system ("Bandwurm") was used.

Conforming to the peculiarity of the traffic the stations
were not designated by call-signs but by cover names which change
on all lines simultaneously but at irregular intervals of time.
No system could be determined in the change of cover names although
the same cover names always keps reappearing.

These stations used frequencies from 1·5 mcs to 12 mcs.

The wireless stations at General Staff and at the Front Staffs
were technically arranged so that they could be used both for
wireless teleprinter traffic and also for high-speed morse
telegraphy. The use of the high speed morse procedure was observed
for the last time about a year ago.

II) The Network of the Front Staffs.

Links existed from the Front Staff to the subordinated armies, assault armies and armoured, artillery and air force units.

The following links exist from the Front Staff:-

To the armies:-

a) Wireless Link. In this network all armies communicated with the front Staff and with each other (network traffic). Hand morse was used exclusively in the wireless traffic of these networks. 3, 4 and 5 figure codes were used for encoding, very important operational orders were encoded by means of the Blocknot code. The individual wireless stations of the network have different receiving and transmitting frequencies, mostly close to each other.

b) Line Connection: Telephone, teleprinter (CT 34) and presumably teleprinter (Baudot 2-channel) connections. To the assault armies and units with special tasks:

c) Wireless, wireless teleprinter (Baudot) and "Hell"-type wireless teleprinter traffic (Line traffic). The wireless teleprinter traffic between the Front Staff and the assault armies can easily be distinguished from the wireless teleprinter lines from the General Staff to the Front Staff since they use low frequencies (1·5 mcs to 2·5 mcs.) and transmit with modulation. These lines also make use of cover names; the cover name of the Front Staff is the same for both lines (Front Staff - General Staff, Front Staff - Assault Army). Call-signs are used in the wireless line from the Front Staff to the assault army. The call-signs of the Front Staffs are different in the different networks as opposed to the cover names of the wireless teleprinter lines.

The subordinate stations of the Front Staff have cover names; in addition to call-signs. In contradistinction to call signs, which varied in the different networks of the same units, the cover names remain the same. These cover names appeared in messages which were passed on from the Front Staff to the General Staff and they probably remained the same in the land line network also.
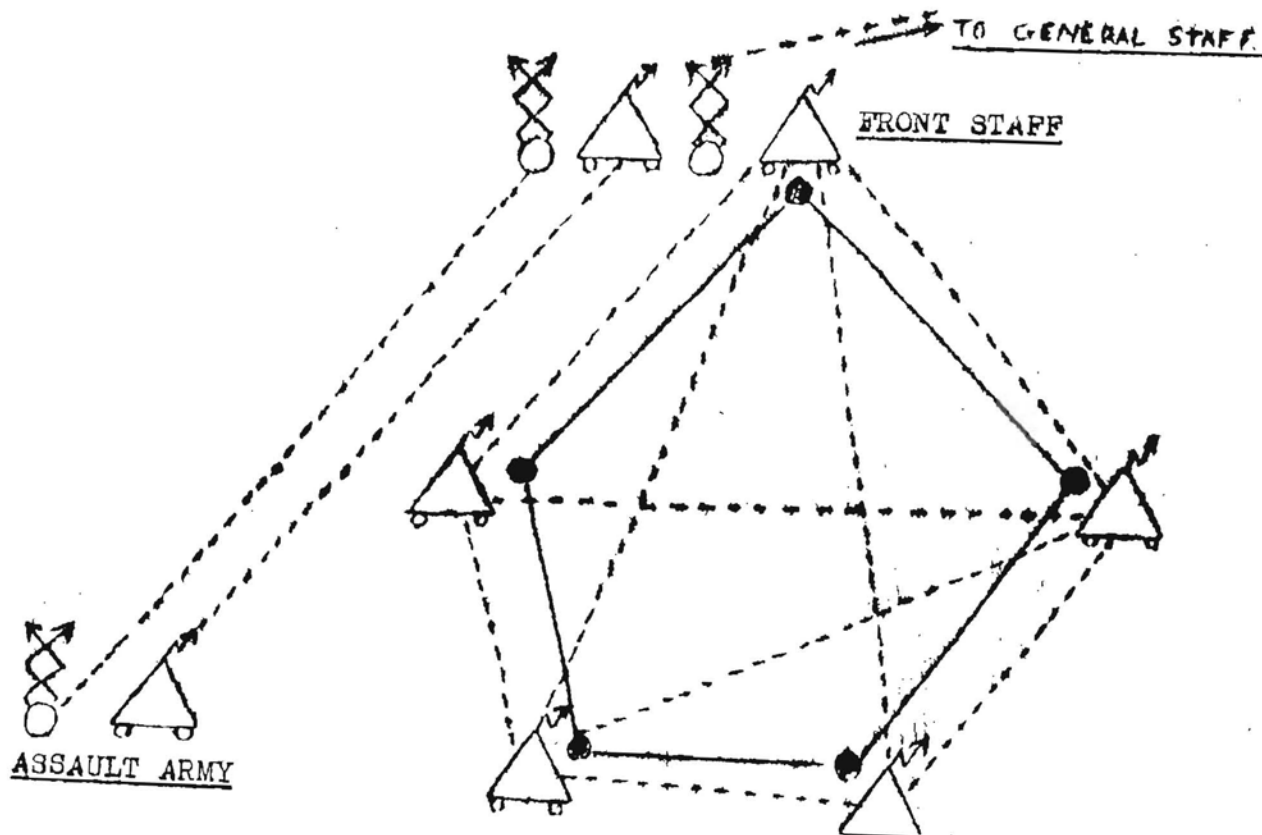
III) <u>Army Networks</u>.

The army networks are not uniform. This is explained by the fact that the armies are made up differently according to their tasks. The composition of the armies was clearly seen from the wireless picture of the army networks and important clues to the identification of units and the tactical duties of the army were obtained. The army wireless stations are in communication with the subordinate divisions and with the artillery, armoured, engineer and air force units allocated to them. An army can have one, two or even three networks according to the number of units subordinated and allocated to it. Army wireless stations of various networks use different call signs. The subordinated divisions communicate with each other in the army network, neighbouring divisions of two army networks have a lateral connection. The allocated units communicate with the army wireless station only (lines in the army network) and constitute, with lower formations, their own network with their own call-signs. In this network the lower formations can, similarly, communicate with each other. If these lower formations (artillery regiments, engineer battalions, armoured brigades) are subordinated to individual divisions they also appear in the network of the respective division.

Army Corps were not observed in this network. Only very seldom did the Rifle Corps appear as an army [Heer] formation. A few Rifle Corps were noted at the beginning of the war but by Autumn 1941 they had completely disappeared and Guards Rifle Divisions then appeared. These were put in at Schwerpunkts and the set-up of their wireless networks varied, like those of the Assault Armies. There was a line between them and the Front Staff to which they were subordinated.

A line connection (teleprinter and telephone) existed from the Army Staff to the divisions.

Almost all enciphering and code methods were employed; important operational messages were encoded by means of the 5-figure and 5-letter Blocknot code. The addresses were in the form of 2-figure groups.

(see Appendix 1)

IV <u>Networks of the Assault Armies</u>

The mobility of the Assault Army and the concentration of special units in it demand a highly developed wireless network. An assault Army has at least two main wireless stations which operate in two main networks with the subordinated units. The armoured, artillery, air force and engineer units may form their own networks.

ASSAULT ARMY

NETWORK OF A BATTLE GROUP

ARMOURED BRIGADE

ARTILLERY

GROUND ATTACK
AIRCRAFT CORPS
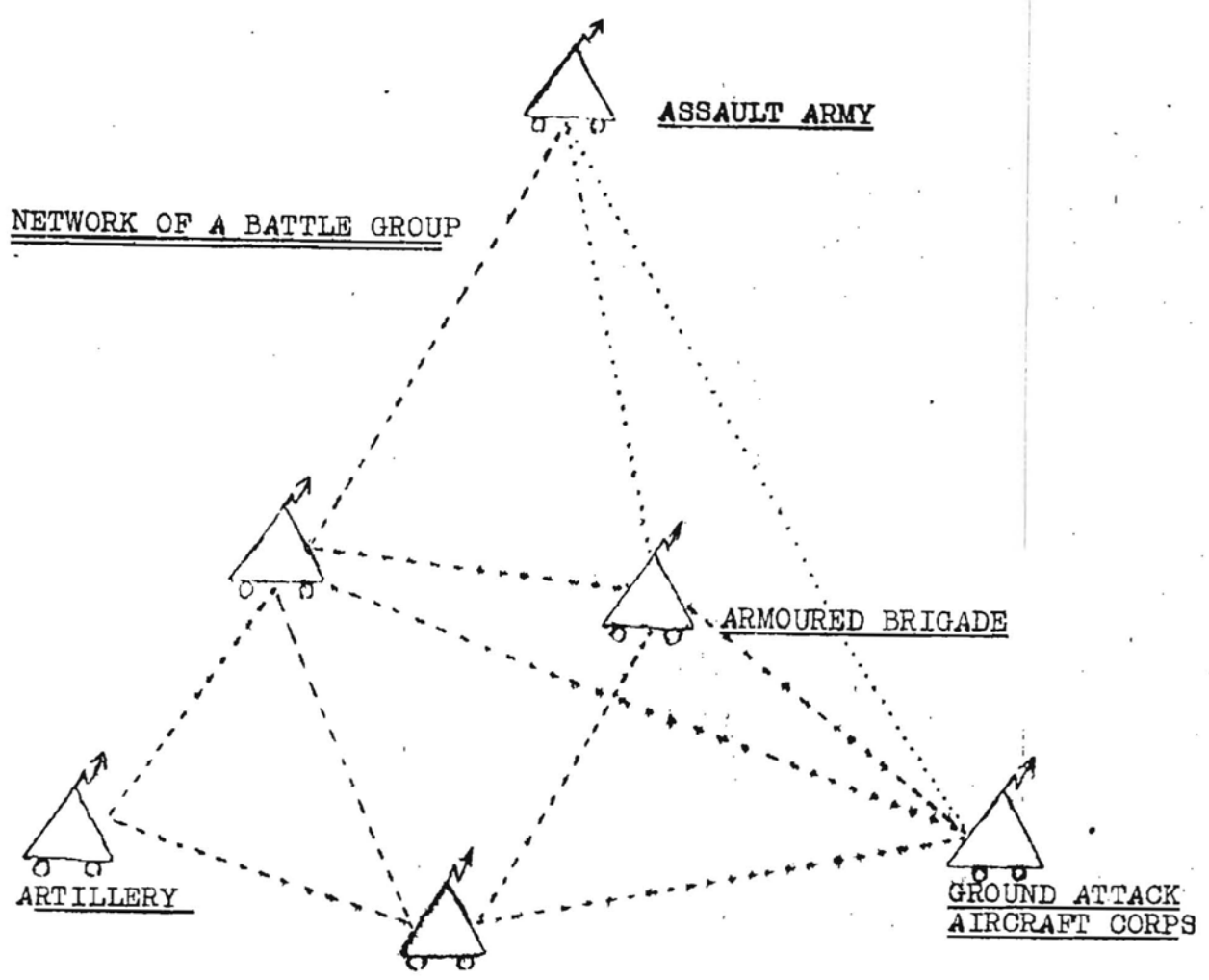
The units of individual Battle Groups form networks in which they operate with each other. The wireless stations of units which have special tasks are able to call the Assault Army from the network of the Battle Group with the same call-sign.

The main wireless station of the Battle Group network is with the O.C. of the Battle Group (usually the O.C. of the armoured or rifle unit).

The networks of Assault Armies are distinguished by the very lively wireless traffic, which is due to the small number of line connections available owing to the mobility of the Assault Army. Owing to the heavy traffic, clear-text messages were transmitted more frequently in these networks than in others.

V. Divisional Networks

Each division constitutes a network with a main wireless station and six to eight subordinate stations. In the divisional network the division communicates with its regiments and with the units subordinated and allocated to it (for instance artillery, armoured etc.). The rifle regiments communicate with each other within the network but are also able to have a lateral connection (with the same call-signs) with the special units operating in their sector or allotted to the regiments. In general, wireless stations of these units turn up in the individual regimental networks. In addition to the wireless link there is also a land line connection to the regiments from the division. The wireless network is used very little during the preparations for an attack and at times there was even a complete wireless silence. All orders for attack were passed on land-lines and the work of the wireless stations only began at the commencement of an attack.

The messages were passed in code, important operational messages were encoded in 5-figure codes. For less important messages, 3 and 4-figure codes and 2-figure Latin square systems were used.

(see Appendix 2).

VI) Regimental Networks

The regiments form either individual lines to the battalions (star) or a network in which the battalions communicate with each other. The armoured units, artillery, assault units etc each have a line to the regiment and, in addition, their own small networks or lines to each other. The constitution of the wireless network depends on the tactical duties and the strength and composition of the regiment. Battalions have lines too to advanced positions, artillery, observation posts etc. In defence the regiment disposes of a very highly developed telephone network. Almost all reports and orders are transmitted via land line. From battalion level downwards this network branches out into several networks which are sometimes connected to each other by exchanges. The artillery, armour etc., also have their own telephone networks which all extend as far as the most forward and most advanced positions and observation posts.

This traffic is only carried out by wireless during an attack and a
rapid advance. Hand-key morse procedure and R/T were used
on such occasions. 2-figure Latin Square, and 3-figure and 4-figure
code systems were mainly used for encoding the messages. The
artillery fire-orders, orders for the movement of tanks during an
attack, and reports from the observation posts and reconnaissance
aircraft were passed in plain language by R/T and telephone.
In addition a code table [Signaltafel] was used by the
artillery and the armour. The wireless stations of the regimental
networks and of individual lines of the battalions used call-signs in
telegraphic traffic and covernames in telephonic traffic. The
call-sign of the wireless station was usually composed of three letters
of the cover name, they were either three consecutive letters or
three consonants, of the cover name (for instance, " марка "
= " мар" or "мрк"). Figure messages were also transmitted
by R/T. The call-signs and cover names of the armoured units
and the air-force often had a numerical suffix, i.e. "карета "-,
" карета1 ",- "карета2",- 'карета3 ". Subordinate
stations of the network (individual observation or reconnaissance
aircraft) adopted this practice.

The Air Force Network

The Air Force had its own networks, which, as in the army, were
set up by each large air force unit. The Sigint control station
only concerned itself very little with air force messages and we did not,
therefore, get sufficient insight into these networks. Three wireless
teleprinter lines (Baudot) were identified, these went from
Moscow (the Head Administration of the Air Force was there presumably)
to the higher air forces HQ's (Air Fleets ?). The traffic corresponded
exactly to that of the wireless teleprinter lines of the General Staff.
The messages, which went to Moscow, were mostly "pass-on"
messages which came from subordinate units, meteorological stations etc., and
were re-transmitted from Moscow to army HQ's and to the higher HQ's of the air
force. The wireless teleprinter lines of the air force had
their own cover names which were changed independently of the cover
names of the General Staff lines. From the Air Fleet Staff the
networks branched out to even the smallest units as
in the Army wireless network. The air force wireless traffic
was distinguished from the army wireless traffic by a few
characteristics in the messages transmitted, i.e.:

    a)   An "X" or some other padding letter between the numerals
         in meteorological messages.

    b)   Special air force expressions in 2, 3 and 4-figure messages
         with an admixture of plain language.

    c)   Mentions in plain language messages of take-offs, and
         permission to land and take-off. These messages appeared
         very frequently and thus the network was easily identified. In
         general, very many more plain language messages were
         passed over air force networks than over army networks.

In addition to the operational air force networks there were also
networks for the ground stations (РАБ - район авиобазирования).
These networks extended over the whole of the Soviet Union
and were recognised by their four element call-signs.

The air force warning service constituted a special network, which ould be recognised from the contents of the messages transmitted. These were short messages which contained details of flying heights, aircraft types, flying route and map reference of the position of the enemy aircraft at the time. They were mostly transmitted in plain language in telegraphic or telephonic traffic (in divisional and regimental sectors). The Air Observer and Communications Stations (BHOC) of the Communications Junctions were in this network also.

In addition to wireless networks the air force had line networks with distant ramifications. There were also line connections from the Air Force HQ's to Army HQ's; Baudot 2-channel, CT 34 teleprinter and other equipment being used.

The Air Force did not contain a Transport Command and these tasks were carried out by Aeroflot. Similarly the training of air force personnel, chiefly pilots, was incumbent on this organisation. During the monitoring of the traffic of the Aeroflot wireless network approximately 30 training "Abteilungen" (учебная эскадрилья) were intercepted. From the contents of the messages it was seen that the training of personnel was not undertaken only for the requirements of Aeroflot but was chiefly for the needs of the air force.

At each Front Staff there was a so-called "Group" which was named after its O.C. These Groups had plain language addresses. Wireless links existed from the Groups to Moscow in which international (fixed, plain language) call-signs were used. The Moscow Control Station was called RBDT and it was situated, like the other Moscow stations (RBYO, UEV, RBFC) of the Aeroflot network, in Millerowo near Moscow. The Aeroflot formations allocated to the Front Staffs did not communicate amongst themselves but with the static Aeroflot units near to them instead.

Networks of the Artillery, Armoured and Engineer Formations

These arms of the services, like the air force also had their own networks, which extended from the Corps down to the smallest units. Messages transmitted in these networks were distinguished from Army traffic by their contents (i.e. special terminology). The appearance and concentration of these units or their networks inside the Army network permitted conclusions regarding enemy intentions to be drawn.

NKVD Networks

All NKVD wireless traffic was divided into two main networks, i.e.:-

1) Administration Networks

The main wireless stations of the network were situated in Moscow. All the larger districts adjacent to each other were linked by wireless to Moscow and to each other and thus constituted individual networks . These networks were distinguished by well executed traffic (partly break-in working). Frequencies from 5 mcs to 15 mcs were used. Traffic was passed at prearranged times with international traffic abbreviations. The call-signs consisted of 4 letters, for which all letters of the Russian alphabet were used. The group separation sign "r " (раздел), characteristic of Russian Army wireless traffic, appeared very seldom. The monthly distribution

of call-signs and frequencies and also the arrangement of
working times, transfers of wireless personnel etc., were transmitted
as either plain language messages or circulars.

The wireless stations usually sent 5-figure messages and,
less often, 4-figure and 5-letter messages. A peculiarity
of these messages is that the penultimate group of all the
above mentioned types of messages contained the date.

2) Frontier Troops Network

Sigint identified approximately 30 Regiments of Frontier
Troops (пограничнные   полки   ) on the Soviet Russian
front, which were directly linked by wireless with the Head
Administration of NKVD troops in Moscow and constituted
individual networks with it. A star traffic existed between the
regiments and battalions. The Frontier Troop network was
distinguished from other networks in exactly the same way as the
administration network by call-signs which consisted of 4-
letter groups. The transmitters of the network worked on short
wave up to 7 mcs.

The messages of the network were encoded by the four and
five-figure code and in the regimental networks use was made of
2-figure systems also. The four-figure code messages of
the NKVD networks had the date group in the penultimate position.
The NKVD code and cipher systems were subjected to change
less frequently than those of the Army. The carelessness in
the encoding of the messages led one to assume that it was not known
that NKVD messages also were being read by the Germans.

Railway Troops of NKVD.   It is certain that at least two
Railway Divisions of NKVD were stationed in the area of the
German Russian front. One of them was number 32 and two
armoured trains were subordinated to it. The wireless traffic of
these divisions was only occasionally monitored by Sigint Control Station and
in consequence no details can be given.

Wireless Traffic of the Black Sea Fleet

The wireless communication connections of the Black Sea Fleet
were split up into individual networks, the stations were not numerous.
The Intercept Service was able chiefly to pick up the control
stations such as Sebastopol, Rostov and Batum. Traffic was
not very heavy between Coastal stations and ships or from ship to ship.
It is also possible, however, that the ships' transmitters
could not be heard owing to their small power compared to the
coastal stations and the great distance from the place of
interception.

The frequencies used by the Black Sea Fleet were in ranges lower
than 150 kcs, from 200 kcs to 400 kcs, from 1800 kcs to 2500 kcs
and from 4000 kcs to 8000 kcs. I do not remember which of
these frequencies were mainly used for inter-coastal station traffic,
from coastal stations to ships and inter-ship traffic.

      Call-signs in this network consisted of 4-figure groups.
I do not know for what length of time these call-signs were
retained or on what principle they were compiled.

      The procedure signals were almost exclusively 2-figure
groups, which were also changed. Only the request for receipt at
the end of a telegram was often passed in clear text (as "qsl ?" or "dk ?").

      The messages were for the most part composed of three-figure
and five-figure groups (code system). The preamble at the
beginning of a message consisted of figures only. Abbreviations,
such as pr (= qto), nr, gr, wr (= Qtr) etc., which were used in other
Russian traffic, did not appear here. The dividers (-...-) between
call-signs and procedure signals or message preambles, and between
the message preamble and the text of the message were usually
omitted. This made the external form of the traffic rather
confusing; one heard a series of figures without knowing which
figures constituted a group because the intervals between the
call-signs and procedure signals were nearly always obliterated.
The stations never "tuned-in" but began at once with the calling
signal. The "to" call-sign was repeated several times. At the
termination of the call-signs there was no pause; the "from"
call-sign followed immediately. This was also usually transmitted
several times, again without any interval. Then followed the
procedure signals and, if applicable, the telegrams. The group
divider "r" usual in Russian military wireless traffic was very
seldom used.

      For example:

to	from	contents
3462	6354	85 47 09 56 - 354 276 986 007 ... ... 467 qsl ? +

On the German side no particular value was placed on the
monitoring of this traffic.

R/T Traffic

    In the networks from divisional level downwards R/T was
employed for the passing-in of communications in addition to
morse traffic. During the latter years of the war the use of R/T
traffic in these networks increased. This can probably be
attributed to the fact that the deficiency of trained wireless
operators was always increasing. At the beginning of the war R/T
traffic, in respect of the opening of traffic, message warning
signals, and the use of the speller alphabet, was carried out
strictly in accordance with regulations. Such was not the case in the
latter years of the war, the traffic sometimes assumed very free
forms. R/T traffic was used for passing messages, fire orders
in the artillery, reports of the Air Warning Service and also for
conversations among officers and commanders. Traffic consisted mostly of
two-figure and three-figure messages, plain language messages and
figure messages mixed with plain language. The wireless stations used
cover names. The call-signs of these stations were mostly formed
from cover names, i.e. мар - марка.

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Examples of R/T traffic:-

a) Start of traffic - repeated calling of the opposite station, tuning-in, contact.

СОКОЛ
Заяц - Заяц - Заяц   Заяц - Заяц - Заяц
Я Сокол, Даю настройку 123456789 10 987654321
Как слышите - как слышите - отвечайте
Я Сокол - Прием.

Заяц - Заяц - Заяц   Я Сокол
Даю насторойку 123456789 10 987654321
Как слышите - отвечайте - я Сокол - Прием.

ЗАЯЦ
Сокол - Я Заяц
Слышу вас плохо - дайте длительную настройку
123456789 10 987654321
Я Заяц - Прием.

СОКОЛ
Даю настройку - 123456789 10 11 12 13 14 15 16 17 18 19
20 19 18 17 16 15 14 13 12 11 10 987654321
Как слышите - вас слышу хорошо
Я Сокол - Прием - Прием.

ЗАЯЦ
Слышу хорошо. 123456789 10 987654321
Прием Прием.

СОКОЛ
Оставайтесь на приеме
Я Сокол - Прием - Прием

b) Change of Frequency, Change-over to Morse Traffic, message warning signal.

ЗАЯЦ
Слышу вас плохо - мешают приему - переходите
на запасную волну.
Я Заяц - Прием - Прием

Работайте ключем

СОКОЛ
Слышу хорошо - приготовтесь к приему

ЗАЯЦ
Готов к приему - передавайте
Я Заяц - Прием

----

c)   Transmission of Messages

Plain language messages were dictated; abbreviations,
names of places, surnames and difficult words were spelt.
During the last years no uniform speller-alphabet was employed,
for instance instead of the usual НИКОЛАЙ   for H,
нина, надежда, никифор   etc
turned up.   From the employment of unusual Christian names
as spellers, the wireless operator and thereby the wireless
station, also, were recognised when a change of cover names took
place.   The two-figure groups were sent either as two digit
numbers with a space between:-

24 56 I2 - двадцать четыре - раздел - пятьдесят шесть -
            раздел - двенадцать - раздел

or as two digit numbers followed by a repetition of the tens
and units of the number separately:

Двадцать четыре - два четыре - пятьдесят шесть - пять
шесть - двенадцать - единица /один/ два

Three and four figure groups were sent without a space
- first the figure group and then a repetition of it, giving
the respective hundreds, tens and units numbers separately.
These figures were sent either as:-

один - два - три - четыре - пять - шесть - семь -
восемь - девять - ноль

or as:-

единица - двойка - тройка - четверка - пятерка - местерка
семёрка - восьмерка - девятка - ноль

The expression ПОЛТИННИК   was occasionally used
for the figure "5 "

Example of a message:

СОКОЛ

Даю радиограмму. Радиограмма № 178 131 группа 16.7.43
Козловскому.
140 - сто сорок - единица четверка ноль - 123 - сто двад-
цать три - единица двойка тройка - 011 - одиннадцать -
ноль единица единица еще раз - 465 857 746 857 968 746 625
867 756 746 524 201 Ошибка - 210 двести десять - двойка
единица ноль -
даю дальше 746 968 756 746 978 857 625 746 857 968 756 524
476 587 978 746 625 756 847 968 857 746 756 847 968 857 756
465 - как принимаешь - Я Сокол - Прием

ЗАЯЦ
Принимаю хорошо - давай дальше

СОКОЛ
Даю дальше - 867 857 746 968 726 746 857 746 968 756 625
857 746 756 726 978 867 756 645 867 978 857 746 625 867 756
978 867 756 847 978 867 756 746 857 746 625 645 867 958

......./..............дайте квитанцию - Я Сокол - Прием

        The request for receipt may be omitted. If a receipt is
asked for, the complete message is usually repeated by the opposite station.
If the message is incompletely received the transmitting station
is asked to repeat the message from a certain group. These requests
were made in the case of longer messages in the pauses, and in the
case of shorter messages only after the complete text had been sent
since transmission is not broken. Circulars were transmitted by
R/T in exactly the same way as by morse traffic. The subordinate
stations were called one after the other and after the transmission of
the message were similarly checked. Procedure abbreviations usual
in other kinds of traffic were also used in R/T traffic. The old
Russian procedure abbreviations too, which had been replaced by the
international ones in morse traffic, were retained in R/T traffic.

For example:-

        СК - связь кончаю
        ПП - принял полностью
        СХ - слышу хорошо
        ПР - примите радиограмму
        ДК - дайте квитанцию   etc.

In addition the international procedure signals such as:

        ГУХОР - НИЛ - ОК etc., were also used.

Inverted R/T Links

In addition to the W/T connections between the larger
towns of the U.S.S.R., R/T was also employed for the transmission
of information. These R/T lines were not very numerous. The
following links existed in the middle of 1943.

                    Moscow   -   Leningrad
                    Moscow   -   Irkutsk
                    Alma Ata -   Taschkent
                    Moscow   - Alma Ata
                    Alma Ata - Tscheljabinsk

I cannot recall whether other links existed or what they could
be. These links were at the disposal of the higher HQ's of the
Red Army and a few Peoples Comissariats. They were connected directly to
the telephone networks of these organisations so that it was easily
possible from the telephone network of one of these authorities in
one town to contact every network subscriber of the corresponding
authority in every other place to which there was a R/T link.

The stations operating this service were on the whole, very
powerful. The frequencies used by them were chiefly between 8 mcs and
15 mcs. Traffic was carried out along roughly the following
lines:- At an agreed time the operator of one of the Stations began
to call the opposite station with international (open, fixed)
callsigns, e.g.

рщк здесь ргп - как слышите отвечайте   etc,

The opposite station usually answers immediately (on another frequency)
with the corresponding counter-call. As a rule the transmitters were
only switched on (as was usually the case in military R/T links) when
someone was speaking (Hapuk modulation). When a satisfactory
connection between stations was made either a subscribers number was
asked for by the operator or the inverting apparatus was switched on.
Up to the end of 1942 conversations were mostly carried on in
clear; open conversations then became fewer and fewer, until by the
end of 1943 they had almost completely disappeared. I know nothing
about the content of the conversations. Inverted transmissions
were picked up twice: the acoustic picture on a magneto-phone tape;
the picture of the oscillations in the usual way by means of a cathode
ray oscillograph on a synchronized moving film. Until the end of
1943 two simple unvarying inverting methods were used:

1) Super-imposed modulation of several audio frequencies on the
   transmission.

2) Artificial raising of the amplitudes of the harmonics of speech
   (addition of a non-linear distortion coefficient ((Klirrfaktor))).

These methods could be solved without difficulty with the help of
(acoustic-electrical) harmonic analysis. Nothing was heard in either
open or inverted transmissions of an alteration of the inverter
device (such as may be effected in the case of the cypher teleprinter
used in Russian FF5 traffic).

At the beginning of 1944 the method of traffic procedure, as well as inversion on all lines, was changed.

At the same time the individual lines were goined together into a network and the latter was still further developed. The individual stations had, by then, more than one (usually two or three) transmitters for simultaneous traffic with various stations. Nothing more was known concerning the locations of the newly joined stations since owing to the advanced state of the war no great importance was attached to the X traffic any longer and the stations were only monitored as far as seemed necessary to solve the new inversion methods.

From now on international call-signs were not used for the traffic, but instead only internal (arbitrary, changing) call-signs (e.g. g7o, 9np etc.,). The starting up of traffic was no longer carried out by the operators in the Russian language but in English or French instead. When the connection had been made the inverter was immediately switched on; no further open conversations were observed.

On various occasions whole transmissions were relayed, e.g. Moscow is linked to Irkutsk but is, however, badly received there. The link Irkutsk - Alma Ata, which likewise has just been set up, is good. Moscow, who can also listen-in on the Irkutsk - Alma Ata link, requests Alma Ata to pass on its transmission. According to the urgency of the Moscow call Alma Ata either interrupts its traffic or else finishes it and lets the Moscow conversation go over its transmitter without inverting again. Alma Ata, therefore, operates as a relay station. The Moscow transmission is then audible on two frequencies.

The new inversion system is quite distinguishable outwardly (audibly) from that previously employed in that every time the transmitter is switched on (that is every time a subscriber begins to speak) a short pulse of about 250 milliseos duration of a constant audio frequency is radiated. A pause of the same length then follows during which the carrier frequency is not emitted. Thereupon the actual inverted transmission commenced.

The (acoustic-electrical) harmonic analysis of the film, recorded as described above, showed neither harmonics nor formants, from which it was concluded that a "cutting-up" of the oscillation (in the direction of the I axis) and its "jumbled" reconstruction was the method used.

(The "strips" in the sketch are drawn considerably broader than is actually the case for reasons of clarity)

The assumption of the "jumbling" led in turn, of necessity, to the further assumption of a process which repeated itself periodically. That is to say, an oscillation which occupies the period of time "t" is split up into n parts; after the expiration of this oscillation a further oscillation, which takes the same time, is divided into the same number of sections. Expressed technically it is a "cutting-up" of the oscillation by means of a distributor with n segments. The number of segments and their sequence and from that the speed of rotation of the distributor arm now had to be discovered. By dint of extraordinarily protracted testing of the "strip" combination (with various widths of strip), the number of segments was found to be 18 (?) and the number of revolutions to be 400 rpm (?). I cannot remember the segment sequence.

A very high degree of synchronism of the distributor arms must be demanded since the individual "strips" were certainly very narrow. There is no synchronisation correction (as used in the multi-channel FF 5 system of the Russians). The following explanation for the synchronism of the distributor arms was arrived at :- The driving motors of the arms in the transmitter and receiver run during the entire traffic period. By means of the short pulse at the beginning of each part of the transmission an electro-magnetic coupling is activated, and this sets the distributor arms in rotation. After the transmitter is switched off the distributor arm always returns to a certain initial position, which, from the technical point of view, is easily carried out. The synchronisation of the motors in the transmitter and receiver can, naturally, only be maintained for a certain time. This, however, does not present any particular difficulty since the character of the traffic is such that a person only speaks for a short time (usually only about 30 seconds).

The difficulty of storing speech "impulses" makes it seem probable that magnetophone tapes were used as storers. There would then be one magneto phone tape to each segment, which would take over the storage of the speech "impulse" belonging to the segment. With the help of a second distributor the parts of the oscillation, traced on the individual tapes, would have to be rearranged and the oscillation reconstructed. The speed of revolution of the distributors on one hand and of the individual tapes on the other hand would have to be exactly the same so that the complete reading off of the parts of the oscillation from the tapes was guaranteed. The traffic would then be picked up according to these principles. These are only conjectures, naturally, It is not known if the inverter did actually work in this manner. The apparatus may function in an entirely different manner. No attempt was made by the Germans to make a copy of the apparatus, because there was no time for it.

The inverter systems were worked on by Dr. Lotze at Wa Pruef 7/IVc.

Call-signs

The call-signs used in Russian army, air force and
NKVD traffic down to divisional networks (i.e. - as far as
all units which can appear in the wireless network of a division)
had the general form XXB. In this X represents a letter of the
Roman alphabet or a numeral with the exception of O. B
represents any letter of the Roman alphabet. Letters such as
.-.- Я , ..— Ю, —— Ч , ——— Ш & ..-.. Э   appearing
in the morse alphabet were omitted for purposes of camouflage.
Similarly nought (O) was not used since it was sent in
abbreviated form (as t) in Russian wireless traffic. Its use,
therefore, might lead to confusion.

The call-signs were taken from a call-sign block consisting of
26 sheets each of $35^2 = 1225$ items. The last element of the call-
sign (XXB) indicated the page of the block (26 pages corresponding
to the 26 letters used), the first (XXB) indicated the row
(horizontal) and the second position (XXB) the column (vertical) of the
bigram square of 35 x 35 items (corresponding to the 35 letters
and numerals used) The complete block therefore contains 1225 x 26
= 31850 items (i.e. different callsigns). Call-signs beginning
with Q and Z were excluded as they might be confused with
procedure signals of the Q and Z code (qtc, qsl, zho, znn etc).
One callsign block was retained for a fairly long time (presumably
a year). It may be assumed that units of the army, air force and
NKVD took their callsigns from one block, for by this means
the simultaneous appearance of the same callsign at different places
was most easily avoided. Callsigns changed at intervals which varied in
the different units from 3 to 14 days. Stations which belonged to the
same network changed callsigns simultaneously.

Units which appeared in networks from regimental level inclusive
downwards used callsigns of the general form BBB in which B represented
any letter of the Russian alphabet. These callsigns were formed
from the covernames allotted to the units. If, for instance, a unit was
allotted the covername " СВЕЗДА" for a certain time, it would use
the callsigns swe, sza, sed etc., in wireless traffic. No changes
might be made in the sequence of the letters however. Cover names were
so chosen that no confusion was possible, in the same way
that callsigns which could be confused with procedure signals
were ruled out. These call signs changed at intervals of one day to a
week, occasionally at the same time as the cipher system employed.
Here, as everywhere else in Russian wireless traffic, there were
exceptions. From time to time it was observed that wireless stations
appeared whose call signs were varied only by the addition of a
numeral. If these stations belonged to a division or higher formation, then
they were several wireless stations of the same unit but if
these callsigns appeared with a small unit then they were individual
aircraft, tanks or "Feuerzüege" (in the artillery) in communication
with the ground station, the leading tank or the battery CO.

The callsigns of a few higher NKVD traffics and of the network of
the "Artillery Reserve of the Supreme Command" were in some cases
of four elements; neither taken from call sign blocks nor formed from
cover names.

In all internal state traffic (Aeroflot, NKRF, NKRM etc.)
international call-signs were used.

The Wireless Message

In a wireless message one differentiates between the preamble, the address, the text, and the signature. The preamble is made up of the warning of the message, the message number, the number of groups and possibly the date and time handed in. The address is given either in plain language (very seldom in army wireless traffic), in special encoded form (in 2-figure groups in 5-figure traffic for example) or included in the encoded text (the most frequent method). The text of the message is either encoded (2, 3, 4 and 5-figure, 5-letter, mixed groups) or in plain language. The signature is included in the (encoded) text in almost all army messages and does not, therefore, appear externally in the telegram. The wireless messages of the various traffics (army, air force, NKVD, internal state networks) are different in their outward appearance as follows:-

   a) Army Traffic

1) pr (or rg) (wo) nr 57 gr 80 vr 0450 - ivanowu -
   35 57 18 90 16 .. .. (not usual nowadays).

2) qto nr 80 gr 75 (vr) 1020 (molniä) - adr naöalxniku
   svazi - 243 465 987 ...

3) qto qsp 12b nr 64 gr 90 1425 - adr no2 - 243 800
   987 ... (pass-on message).

4) qto nr 387 gr 100 ö 1$^{(+)}$ - opersvodka 240012743 - 2431
   4098 3657 8576 .... .

5) qto iz karuselx nr365 gr 46 1012 1215 - fonarx - 15280
   46573 10098 .....

Requests for receipts in all the above examples are "qsl?" or previously (example 1) "dk?". The address is either in clear (seldom, see above) and contains the name, name with rank, unit - or if the name was not known the office or function (i.e. komandiru divisii, naöalxniku swäzi or abbreviated no2, nus, od eto) - or is encoded. The encoding of the address is carried out either by cover tables (e.g. in the form of a 2-figure group), by a Latin square code (e.g. in the form of more than one 2-figure groups) or by including it in the encoded text.

Examples:-

qto   nr 65 gr 403   1200 - 25 36 19 67 74 83 00   15200
16523 18820 .....

qto nr 65 gr 403 1200 - 46 - 2003 1882 1664 ....
qto 'r 65 gr 403 1200 - 243 365 911 255 ...

(+) ö1 = öastx 1 = Part 1.

DOCID: 3283552

b) Air Force Traffic

1) All the message preambles usual in Army Traffic.

2) qtc nr 46 gr 24 vr 2345 - avio - 3654 5876 0087 ....

3) qtc nr 37 gr 46 vr 1425 - metao - 25436 47653 x2435 24xx1
7x476 58746 .....

4) qtc nr 24 - 165426 8000 sv 40 me 110 1215 - qsl? or qtc nr
24 - samolet protivnika me 110 kvadrat 165426 vysota 8000
kurs ügo zap 40 gradusov vremä 1215 - qsl ? (Air Warning Message).

c) NKVD Traffic

1) pr nr 467 gr 87 vr 1000 nk 3654 2887 1024 ....
2543 1210 7356 dk ? +

2) qco ? nr 356 gr 80 (vr) 1415 nk 16542 37645 18726
..... 16548 12104 74653 qsl ? + k

3) qoo ? nr 264 gr 56 1615 nk 29536 hügfx qopäf .....
..... yetue 22764 12104 74653 qsl ? + k

d) Internal State Traffic

1) iz dvusaly 367 34 0810 1530 vs - rbfr aeroport glübkinu - (Text)
- gradusov +

2) fm habarovska (nr) 853 76 1212 2200 ss - msk a/p klükvinu - (Text) -pbd
polkovnik tamarenko +

3) iz rbim (Call-sign.) 65 80 1012 1245 - msk markinu - (Text)-0020 +

4) fm grk (Gorkij) 653 69 0110 1450 - barnaul plüchkinu - (Text) -
25/2 efremeev +

5) por 20 moskvy 2435 40 30/1 2400 - kujbychev glavneftesnab petrovu -
(Text) - öozrek (Unit)   martinovlö 243/12 +

6) 15 baku 2435 27 24/7 1325 - msk narkomhimprom golxdsteijnu -
(Text) - glavnyj invener akimov +

Examples 1) to 5) are from Aeroflot traffic, example 5) from NKRF
(Peoples Commissariat for River Shipping) and example 6) from Postal
Traffic.

Passing of Traffic in Army, Air Force and NKVD Networks.

The intercept operators had a "Day Report" for listing traffics,
into which all transmissions heard from Russian military wireless
stations were entered. The Day Report was chiefly for the use
of the Traffic Analysis Section. The following were entered
in it: Time of Intercept, callsigns, frequency, text, and remarks
of the intercept operator. From a Day Report one could see the
total traffic of a line or a network. The wireless sitreps were compiled
from the Day Report.

Example of a Day Report:

Time	Freq. Kc/s.	To		From	Contents	Intercept Number	Remarks
09 00	3200	12b	de	4rz	qrk? qto +		
02	3220	4rz	de	12b	ok qrk 3 qsv +		
03	3200	12b	de	4rz	ok? qrk? qto ga? +		
07	3220	4rz	de	12b	ok qrk 5 ga +		
09	3200	12b	de	4rz	ok - qto nr 46 gr 76 wr 0840- (S/F) qsl? pse k	1	
23	3200	12b	de	4rz	guhor qsl? nr 46 vvv +		
25	3200	4rz	de	12b	ok rpt nr 46 gr ot 20 do 34 - ok? +		
28	3200	12b	de	4rz	ok rpt nr 46 gr ot 20 do 34-(Repeat of groups) qsl? ck? +		
34	3220	4rz	de	12b	vvv qrm rpt nr 46 ot 20 do 34 ok? +		
36	3200	12b	de	4rz	ok as 10 (wait 10 min.)+		
37	3200	abq	de	4rz	qrk? qto molniä →		
39	3290	4rz	de	abq	ok zho? ga spe K (+)		
40	3200	abq	de	4rz	ok - qto molniä nr 25 gr 40 0925 - (S/F) qsl? + k	2	
45	3190	4rz	de	abq	qsl nr 25 gr 40 ok - om qto? pse k		
46	3200	abq	de	4rz	ok tks nil qrx do 1200 ok? k		
47	3190	4rz	de	abq	ok tks qrx 1200 gb +		
48	3200	12b	de	4rz	zho? k		
49	3220	4rz	de	12b	vy qrm qrk r 4 om sld na 140 ? (++) + k		
50	3200	12b	de	4rz	ok bd slv wolnu 140 ok? + k		
51	3220	4rz	de	12b	ok sld + k		
53	3500	12b	de	4rz	Zho? ok? + k		
56	3220	4rz	de	12b	ok qrk r 6 rpt nr 46 gr ot 20 do 34 +		
57	3500	12b	de	4rz	ok rpt nr 46 gr Ot 20 do 34 - (Repeat of groups) - qsl? + k		
1000	3220	4rz	de	12b	ok qsl nr 46 gr 76 - qto? k		
02	3500	12b	de	4rz	ok nil qrx do 1200 wolna 128 ok? +		

Time	Freq. Kc/s.	To		From	Contents	Intercept Number	Remarks
1004	3220	4rz	de	12b	ok qrx 1200 +		
1200	3200	12b					
		abq	de	4rz	qrk? pse k		
		v4g					
02	3220	4rz	de	12b	ok qrk 4 qto? +		
03	3190	4rz	de	abq	ok om qrk r 5 vy, gd pse k		
03	3210	4rz	de	v4g	ok qrk 5 qtr? + k		
05	3200	12b					
		abq	de	4rz	ok qtr 1207 - 24		
		v4g			35 75 09 24 23 - ok? + k		
08	3220	4rz	de	12b	ok tks +		
09	3190	4rz	de	abq	ok my tks znn + k		
09	3210	4rz	de	v4g	ok nil +		

(+)   The Z Code (High Speed Traffic) was used in addition to the Q code.

(++)   sld = go over to ... , slv = I am going over to ....
The number following sld or slv when multiplied by 25 gives the new working frequency.

The Use of Cover Tables

    In messages of the divisional, regimental and battalion networks and also in plain language conversations, cover names were used for common military expressions and tactical measures. Some of these cover names were used uniformly on the entire front and for the whole period of the war, others, however, appeared only in certain sectors of the front, and were later changed. Some cover names which were used throughout the whole war lost their original purpose of a cover and became generally used "expressions". The following cover names can be included in this category:-

      Unit   -   ХОЗЯЙСТВО

      Unit O.C. -   ХОЗЯИН

      "Stalin Organ" Salvo Gun - Катюша - Марья Ивановна.etc.

The use of cover names did not present any great difficulties on the whole and the individual cover names were relatively quickly interpreted.

ПИЛОТКА - березка - Red Army Man (Rotarmist)
НОГИ - палки - Infantry (Infanterie)
коробка - коробочка - Tank (Panzer)
коробочка - американка - Wireless Set (Funkgerät)
НИТКА - Line (Leitung)
паук - Exchange (Vermittlung)
паутинник - Line Layer (Leitungsleger)
козел - Machine Gun (Maschinengewehr)
козел с козлятами - MG with crew (Maschinengewehr mit Bedienung)
Максим Максимович - Maxim MG (Maschinengewehr "Makssim").
палка - карандаш - Rifle (Gewehr)
ДЛИННАЯ ПАЛКА - Sharp Shooter Rifle (Scharfschützengewehr)
сажать огород - To mine (Verminen)
КУХНЯ - Artillery (Artillerie)
зуботочка - Tank Ammunition (Panzer Munition)
сестра - Battery (Batterie)
лепешка - mine (mine).
мокрый - Dead man (Toter)
лягушка - Mortar (Granatwerfer)
собака лает - Mortar firing (Granatwerfer schiesst).
огурцы - Shells (Granaten)
корова - Gun (Geschütz)
погода - Situation (Lage)
как погода What is the situation (wie ist de Lage)
солнце светит - Everything all right (alles in Ordnung)
кулак - Point of main effort (Schwerpunkt)
черепаха - Tractor (Zugmaschine)
концерт - Drum Fire (Trommelfeuer)
музыка играет - Artillery firing (Artillerie schiesst)

Abbreviations most frequently used in Traffic

a). In the infantry

СК = стрелковый корпус - Rifle Corps
СД - стрелковая дивизия - Rifle Division
СБ - сбр - стрелковая бригада - Rifle Brigade
СП - стрелковый полк - Rifle regiment

The following may stand before an abbreviation:-

г - гвардейский - Guards
к - краснознаменный - Red Flag
о - отдельный - Independent

for instance:-

гсд - гвардейская стрелковая дивизия
    = Guards Rifle Division

кгсд - краснознаменная гвардейская стрелковая дивизия
    = Red Flag Guards Rifle Division

огсд - отдельная гвардейская стрелковая дивизия
    = Independent Guards Rifle Division

ксд - краснознаменная стрелковая дивизия
    = Red Flag Rifle Division

If units distinguished themselves in an undertaking they were granted a special "Title of Honour" e.g.

киевская дивизия,　　орловская бригада

The initial letters of these titles also appeared in the abbreviation of the unit, e.g.

жгсд - житомирская гвардейская стрелковая дивизия

b) In the cavalry:

КК - кавалерийский корпус - Cavalry Corps
КД - кавалерийская дивизия - Cavalry Division
КП - кавалерийский полк - Cavalry Regiment
КЭ - кавалерийский эскадрон - Cavalry Squadron

as with the Rifle Units:-

ГКК - гвардейский кавалерийский корпус
　　　Guards Cavalry Corps

ККК - краснознаменный кавалерийский корпус
　　　Red Flag Cavalry Corps

ГККК - гвардейский краснознаменный кавалерийский корпус
　　　Guards Red Flag Cavalry Corps

c) In the Tank Arm:

та - танковая армия - Tank Army
ТД - танковая дивизия - Tank Division
ТП - танковый полк - Tank Regiment
тб - тбр - танковая бригада - Tank Brigade

as with the infantry units

гтбр - гвардейская танковая бригада -
　　　Guards Tank Brigade

гктбр - гвардейская краснознаменная танковая бригада -
　　　Guards Red Flag Tank Brigade

отп - отдельный танковый полк -
　　　Independent Tank Regiment

d) <u>With The Artillery</u>

ад - артиллерийская дивизия - artillery division
ал - артиллерийский полк - артполк - artillery regiment
гап - гаубичный артиллерийский полк - medium art.(howitzer) regt.

гап - гвардейский артиллерийский полк -
      guards artillery regiment
абм - артиллерия большой мощности -
      medium artillery
аргк - артиллерия резерва главного командования -
      artillery reserve of the Supreme Command
ДА - дивизионная артиллерия - divisional artillery
ПА - полковая артиллерия - regimental artillery
БА - батальонная артиллерия - battalion artillery
ЗА - зенитная артиллерия - Anti-aircraft artillery
ЗАОН - зенитная артиллерия особого назначения -
      Anti-aircraft artillery for special employment
АПП - артиллерия поддержки пехоты -
      Infantry support artillery
МПП - минометы поддержки пехоты -
      Infantry support mortars
АПТ - артиллерия поддержки танков -
      Tank support artillery
АДД - артиллерия дальнего действия -
      Long range artillery

e) <u>With the Air Force</u>

ва - воздушная армия - Air Army
вк - воздушный корпус - Air corps
ад - авио дивизия - Air division
ап - авио полк - Air regiment

similarly:-

гад - гвардейская авио дивизия - Guards Air Division

лбап - легко-бомбардировочный авио полк -
      Close support Air Regiment

тбап - тяжело-бомбардировочный авио полк -
      Long range bomber air regiment

шап - штурмовой авио полк - Ground attack
      aircraft regiment

рап - разведывательный авио полк -
      Air Reconnaissance regiment
иап - истребительный авио полк - Fighter regiment

утап - учебно-тренировочный авио полк -
      Air Demonstration ((Lehr)) regiment
раб - район авио базирования -
      Air base district
бао - база авио обслуживания -
      Aircraft Servicing Station.

f) <u>With Signals Troops</u>

бс - батальон связи - signals battalion

обс - отдельный батальон связи -
      independent signals battalion

пс - полк связи -
      signals regiment

тср - телеграфно -строительная рота -
      telegraph construction company

тэр - телеграфно - /телефонная/ - эксплоатационная рота -
      telegraph/telephone operating company

кср - кабельно-строительная рота - cable construction company

ЦТС - центральная телефонная станция - exchange

ОТС - оконечная телефонная станция - end telephone station

ПТС - промежуточная телефонная станция - intermediate telephone
                                           station

КТС - контрольная телефонная станция - control telephone station

ВТС - военная телефонная станция - army telephone station

УНА-И - унифицированный /телефонный/ аппарат индукторный
        Field Telephone with inductor call (universal pattern)

УНА-Ф - унифицированный /телефонный/ аппарат фонический
        Field Telephone with buzzer call (universal pattern)

ТАМ - телефонный аппарат мощный
                    High power telephone

рация - радио-станция - wireless station

ТК - АК - РБ - РСБ - типы радиостанций
                     types of wireless stations

УС - узел связи - communications junction

НУС - начальник узла связи - OC of communications junction

НС - начальник связи - OC of communications services

др - дежурный радист - Duty wireless operator

дс - дежурный по связи - Duty signals officer

ПВС - пост воздушной связи - Air Force Communications Station

ВНОС - воздушное наблюдение оповещение и связь -
        Air Observer and Communications Station

ПСД - ПС - пост сбора донесений - Report Collecting Centre

g) <u>With HQ's</u>

НО I, /-2, -3, -4, -5, -6/ - начальник первого /второго/
отдела штаба

OC of the 1st (2nd, 3rd, etc.,) departments of the HQ.

ОД - оперативный дежурный -   Duty Officer

ШО - шифровальный отдел -   Cypher Section

ОО - оперативный отдел -   Operational Section

КП - кп - командный пункт -   Command Post (Battle HQ).

<u>Sigint</u>

The Soviet Russian command attached the greatest importance to
Sigint. Owing to the strictest secrecy instructions and effective
security measures, very little could be learnt about the work of
sigint and the development and organisation of signals troops.
The picture one was able to form of Sigint in the Soviet Union is,
therefore, not complete and not absolutely reliable. From a few
captured secret orders of the period from 1938 to 1940 (for
instance; Наставление по радиоразведке)   and prisoners'
statements one was able to gather the following:-

The work of Sigint extended over four main divisions

1) Wireless Recce - радиоразведка - радиоподслушивание

2) Direction finding - пеленгация

3) Line Intercept Service - подслушивание

4) Spy Service   - агентурная разведка

The wireless recce stations worked in the closest liaison with
the direction finding stations. Their duty consisted of intercepting and
evaluating the complete enemy wireless network. Generally speaking
the operational area of the Soviet Russian wireless recce units is
roughly 80 to 100 kms behind the front. The reason for this
is probably to safeguard the units from the possibility of being
captured and to prevent important highly secret material from
falling into enemy hands. The main task of Soviet Russian Sigint, as
far as one could gather from orders and prisoners' statements, is to
acquire a knowledge of the grouping of enemy troops and their
locations and enemy intentions and strengths, <u>not</u> from the texts of
intercepted messages but from the wireless picture and the D/F results.
The larger sigint units were with the HQ's of Fronts, armies and corps
(радиоразведывательные роты = sigint companies). Divisions were
only allotted smaller units (взводы = platoons), which, however, knew

very little of the work of their superior stations for security reasons.
These were mostly only single close range D/F platoons, line intercept platoons
or line intercept sections. It is possible that, in addition, still
smaller units which belonged to divisions and regiments were employed.

Much attention was paid to the Line Intercept Service. We found
numerous instructions and orders relating to the Line Intercept Service —
the types, possibilities and the importance of monitoring telephone
and telegraph networks.

The following methods were used in practice:

a) Direct contact on to the lines by means of the listening clips.

b) Laying out of line intercept loops [Lauschschleifen]

c) Employment of line intercept earths [Lauscherden]

d) Listening by means of lines which were left behind,
    camouflaged in an area ceded to the enemy.

The Spy Service (агентурная разведка   ) forms a
special branch of Sigint. Individual small sections, specially trained
for this purpose had special tasks and they were put down in enemy
occupied territory. They usually had the task of supplementing
incomplete intelligence by their own observations. The results
of the spy work were transmitted by means of a short wave set
(север).

The Sigint control station is situated at General Staff, and presumably
comprises Department 8 of the General Staff. It is the head
organisation of the whole wireless and line intercept service.
This Department 8 (особое назначение связи - ОНС)
is split into three sub-departments:-
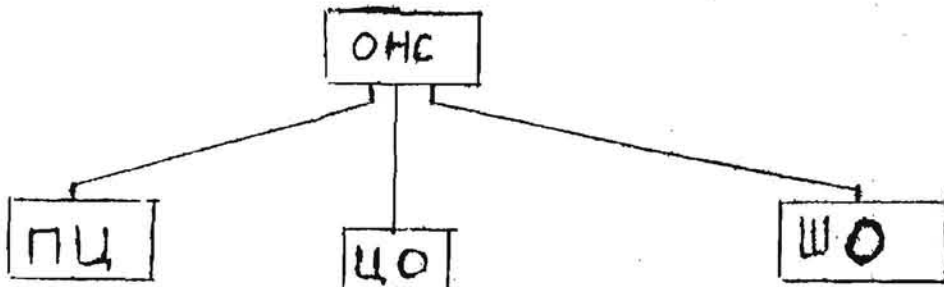
1) Main Intercept Station (приемный центр / пц /)
The Main Intercept Station is presumably an intercept station
for the wireless traffic of higher HQ's and special machine systems.

2) Evaluation (центр обработки / цо /　　). The final
evaluation of the entire sigint material was undertaken here.
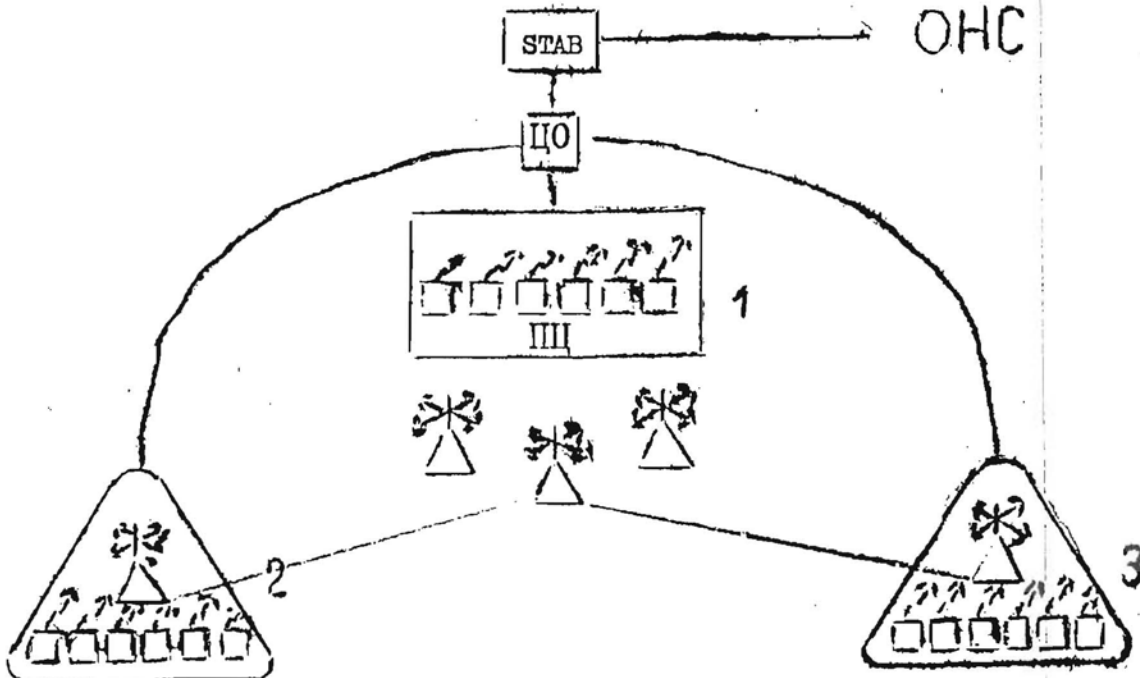Sigint situation reports, summaries etc., were presumably
compiled here also.

3) Cypher Department (шифровальный отдел/шо/). The
task of this department is de-coding and work on enemy cipher systems.

The sigint units of the Front, Army and Corps, HQ's are
subordinated to "Department ONS". A schematic representation of this
organisation results in the following diagram:

Front HQs
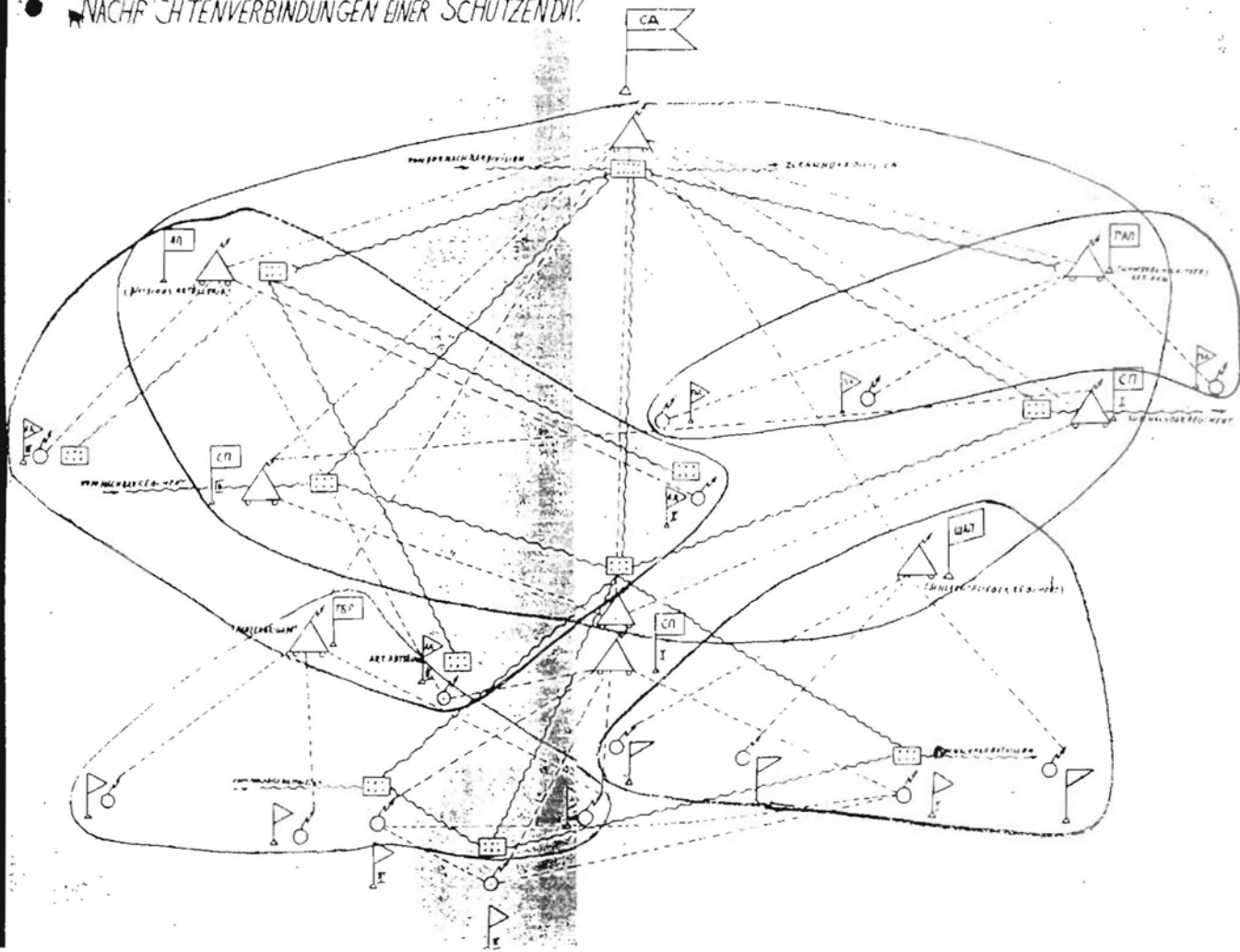
Army HQs

Corps HQs

Divisional HQs
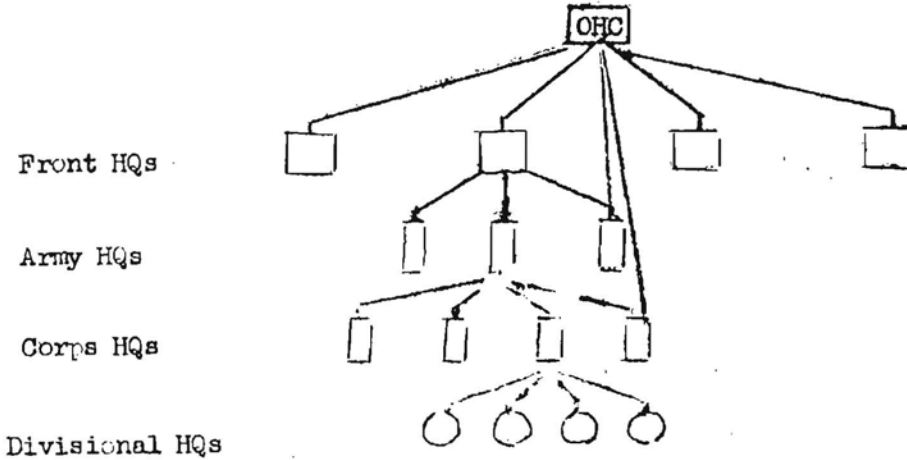
The sigint units of the army and corps HQ's are presumably
subordinated to Department ONS directly and indirectly (i.e. via the next
higher HQ). This simplifies communication to the control station.

One sigint company (радиоразведывательная рота) each was
subordinated to the Front, Army and Corps HQ's. The organisation can be
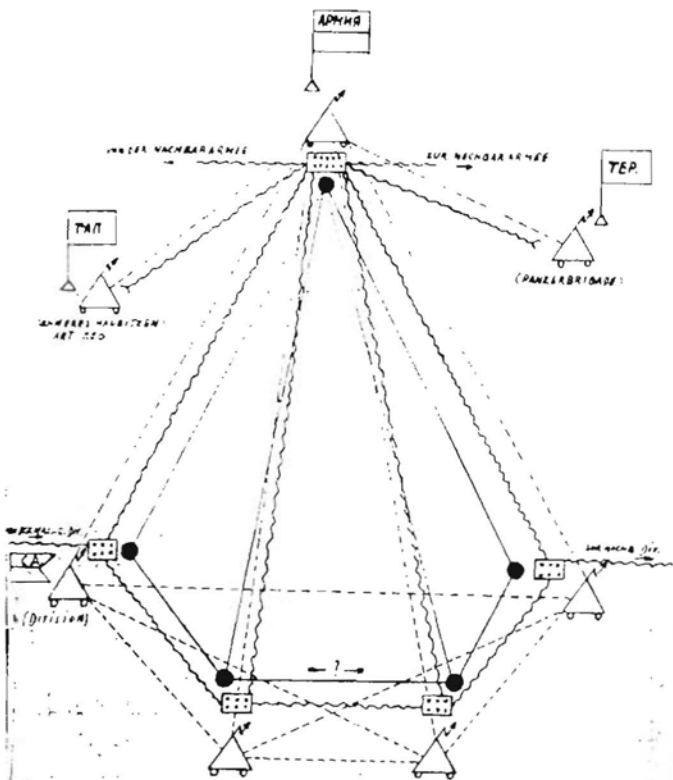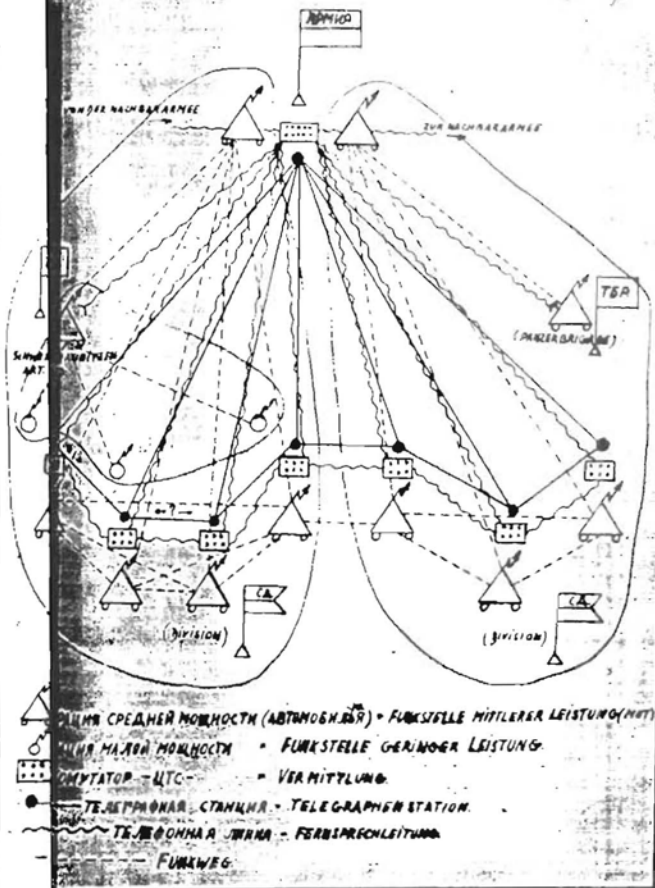approximately represented as follows:

NACHRICHTENVERBINDUNGEN EINER SCHÜTZENDIV.

ARMEENETZ MIT EINER FUNKSTELLE.

ARMEENETZ MIT ZWEI HAUPTFUNKSTELLEN.

СРЕДНЕЙ МОЩНОСТИ (АВТОМОБИЛЬНЯ) • FUNKSTELLE MITTLERER LEISTUNG (MOT)

МАЛОЙ МОЩНОСТИ • FUNKSTELLE GERINGER LEISTUNG.

МУТАТОР - ЦТС - VERMITTLUNG.

ТЕЛЕГРАФНАЯ СТАНЦИЯ - TELEGRAPHEN STATION.

ТЕЛЕФОННАЯ ЛИНИЯ - FERNSPRECHLEITUNG.

— FUNKWEG.

The Evaluation Department is in direct contact with the
operations and reconnaissance departments of the HQ. The link
to ONS goes either via the HQ or direct. An intercept station 1
with a few D/F sets is similarly situated directly at the HQ.
Approximately 2 platoons of the sigint company are sent forward,
these are also equipped with intercept and D/F sets.

The direction-finders work according to a Command D/F
procedure (синхронная пеленгация   ) and are directed
by a Command Transmitter which is situated at the HQ. Direction
finders were very much used in the Soviet Russian sigint. This is
probably explained by the fact that the machine cypher
systems of the German army were difficult to break and most sigint
results were obtained from the monitoring of wireless
networks. D/F sets were distributed down to divisional level and
Line Intercept Sections were used in the front line by the
divisions.

Sigint Companies were not allocated to every high HQ but
were only used in points of main effort and were always subordinated
only to the ONS. It could not be determined how the work there was
carried out. It can be assumed that Platoons 2 and 3 operated detached from
the main intercept station. Interception and monitoring over a larger
area was possible by this means.

The strength of a sigint company was calculated to be up to
180 men. (Platoons 2 and 3 are sub-divided into six to eight
sections). The companies of the Front Staffs are probably larger
than those of the Corps; also the number of sigint platoons in
a company will have been correspondingly higher. A sigint
platoon is equipped with approximately 8 receivers and 1 or 2
D/F sets.

Organisation of the Intercept and D/F Stations

Intercept Stations

A representative selection of Russian Army wireless traffic
could be intercepted with 20 intercept stations as widely
distributed as possible. Complete interception was naturally
impossible and not even necessary. An intercept station had, on
the average, 20 working sites each with 2 receivers. Of these 15
were usually employed in monitoring already known important
networks. The rest of the receivers were available for special tasks
and recently identified networks. According to the size of
the commitment of the receivers, "search areas" were allotted to them
which were monitored for new army traffics. The band from 2.5 mcs
to 3.5 mcs, which produced the greatest traffic density, was
divided among 10 receivers (a search area of 100 kcs to each
receiver). The band beneath 2.5 mcs, which showed a small traffic
density, could be adequately covered by 2 receivers. The next
highest band from 3.5 mcs to 5.5 mcs was sufficiently intercepted by
5 receivers (500 kcs to each receiver). The band from 5.5 mcs to
roughly 10 mcs was adequately monitored by 3 receivers. During the
day stations under 4 mcs were mostly difficult to hear and the search areas
were, therefore, shifted to the higher frequencies. By night the
higher search areas were discontinued and the receivers thereby

made available were given search areas on the lower bands. In
general the day and night frequencies of the army wireless traffic did not
show any great differences. Stations at a great distance from the
point of interception, with frequencies lower than 4 mcs and of
average power were mostly difficult to hear or inaudible during
the day. The difference in the conditions of reception in summer
and winter were also noticeable.

Three types of receivers were used at intercept stations. The
pack receiver b (an ordinary receiver of medium sensitivity and
selectivity, range 90 kcs to 7095 kcs) and wireless intercept
receiver b (Fu.H.g. range 800 kcs to 3800 kcs) were adequate for
army wireless traffic to army level inclusive. For wireless
networks of the Front HQ's, NKVD administration networks and
internal state traffics, wireless intercept receiver C was used,
(Fu.H.c, range 3600 kcs to 27000 kcs and Fu. H.b. are powerful
super heterodyne receivers with good sensitivity and high
selectivity. They are special sets for the intercept service).
The close-range sigint platoons had in addition special receiving
sets for the interception of R/T traffic (Fu.H.u and Fu.H.lmW).

D/F

On the average 3 to 4 D/F sets, which had to have a good
D/F base-line, were employed to fix stations which were to be
recce'd. The following static D/F stations (Adcock Goniometer)
operated against the USSR:- Kirkenes, Cranz and Barsen near
Königsberg, Prussia, Reichshof in south-west Poland, Debreczin in Hungary
and Constanza on the Black Sea. In addition each Sigint Commander
had 6 mobile long range D/F sets at his disposal. Orders for D/F's
were issued from the intercept stations. The wireless operator in charge
worked in the intercept rooms and passed on the frequencies to be
D/F'd, which were called out to him by the intercept operators, to
the D/F sets by means of a command transmitter. A simultaneous D/F'ing
of a station by more than one (usually three) D/F sets was thus
attained. Orders were also passed by land line but owing to
the delay this was only usual in cases of line bearings by D/F sets
linked directly to the intercept stations. A static D/F set
usually received orders from two intercept stations. In
addition close-range D/F sets were in operation, they were
employed in close-range sigint and in the fighting against
guerillas.

Training of Wireless Personnel

The interception of the Russian Army wireless traffic did not,
in general, demand any special ability in taking traffic (reception
of morse signals). A speed of 100 letters a minute (i.e. 20
words a minute) is adequate. Skill in taking figures is particularly
important since Russian army telegrams are almost exclusively figure
messages. Knowledge of traffic procedure is also important.
International procedure signals must be known also the chief
characteristics which identify Russian Army wireless traffic -
figure messages in 2, 3, 4 and 5 figure groups which are separated by
an "r", no "breaking-in" traffic (i.e. the opposite station only replies
when the station has finished its call or message). The appearance
of words and abbreviations such as ot, do, na, sld, slv, which
very frequently occur, unmistakably indicated Russian traffic; also
the designation of the urgency in the preamble (qto nr 112 gr 50
1250 - molniä -) easily permits Russian traffic to be identified.
The air force had its own networks which were clearly distinguished
from the general army traffic by the frequent transmission of
weather messages (figure groups with "x" or another padding letter).

The NKVD networks were distinguished by well conducted
wireless and 4-letter call-signs. In place of "qto" they used
the abreviation "qoo?". The usual group separating
sign "r" was often omitted in these networks. All NKVD
messages, whether 5-letter or 4 or 5-figure, had the date in the
penultimate group.

If the beginner had had two months instruction in taking traffic
and had acquired some knowledge of wireless traffic routine,
he could generally be posted to an intercept set as "second
listerer" to an experienced operator. He would work here
for two or three weeks under constant supervision and instruction
and in most cases would then be able to work on his own.
Networks with good signals strength, which neither have a
great amount of traffic nor transmit particularly quickly, were
especially good for initiating wireless operators. After
4 or 5 months the operator should be able to intercept the average
type of traffic completely and without errors.

For the reception of the internal state networks qualified
people were needed. One hundred and thirty letters a minute (i.e.
25 words a minute) would have to be able to be taken, even in face
of bad keying, low signals strength and intern'erence. Skill in
taking plain language messages, which comprised 70% of the traffic
taken, was particularly important. A good knowledge of the
procedure characteristics and some knowledge of the language
(very slight, however) are necessary. These are easily
acquired in the course of practice in the traffic.

Translations in the Appendices

Beilage 1   =   Appendix 1

Armeenetz mit einer Funkstelle = Army Network with one Wireless Station

von der Nachbararmee   =   from the neighbouring army

zur   "   =   to the neighbouring army

Panzer Brigade   = Tank Brigade

Schweres Haubitzen Art. Reg.   = Medium howitzer Arty. Regt.

Funkstelle mittlerer Leistung (mot) = Medium powered wireless station
(motorised)

Funkstelle geringer Leistung   = Low powered wireless station

Vermittlung   =   Exchange

Telegraphenstation   = Telegraph station

Fernsprechleitung   = Telephone line

Funkweg   =   Wireless Link

Beilage 2   =   Appendix 2

Nachrichtenverbindungen einer Schützendiv = Signals Connections of
a Rifle Division

von der Nachbardivision   = from the neighbouring division
zur   "   = to the neighbouring division
Schweres Haubitzen Arty.Regt. = Medium howitzer Arty. Regt.
Panzer Brigade   = Tank Brigade

vom Nachbarregiment   = from neighbouring regiment
zum   "   = to   "   "

Schlachtfliegerregiment   =   Ground attack aircraft regiment

Art. Abteilung   = Artillery Abteilung

Divisions Artillerie   = Divisional artillery

von Nachbarbataillon   = from neighbouring battalion
zum   "   = to   "   "

Panzer Abteilung   = Tank Abteilung

(Translators: WRL/KCK).